

CASE REPORT

Double-barrel Coronary Artery Dissection

Pai-Feng Hsu, Tse-Min Lu, Hsin-Bang Leu, Wan-Leong Chan*

*Division of Cardiology, Department of Medicine, Taipei Veterans General Hospital,
and National Yang-Ming University School of Medicine, Taipei, Taiwan, R.O.C.*

Coronary artery dissection is a common occurrence after percutaneous transluminal coronary angioplasty (PTCA). However, we report herein a rare case of double-barrel coronary artery dissection occurring 1 year after PTCA for stenosis in the left circumflex coronary artery. The case history and angiographic findings are reported, and relevant literature is reviewed. [*J Chin Med Assoc* 2005;68(8):383–385]

Key Words: coronary artery disease, coronary artery dissection, percutaneous transluminal coronary angioplasty

Introduction

Coronary artery dissection is a common occurrence after percutaneous transluminal coronary angioplasty (PTCA).¹ Although most events of non-flow-limiting dissections are not associated with early and late ischemia, complex dissections may result in acute closure of a coronary artery and can be treated effectively by coronary stenting. However, assurance of guidewire in the true coronary lumen is mandatory, otherwise the stent placement will impair distal coronary flow. Herein, we present an interesting and extremely rare case of complicated coronary artery dissection after PTCA. Without placement of a stent, the long and complex dissection appeared as a double-barrel coronary artery at follow-up coronary angiography 1 year later.

Case Report

A 67-year-old man with diabetes and hypertension was admitted for evaluation and treatment of exertional chest pain. Coronary angiogram showed 2 stenotic lesions in the left circumflex artery (Figure 1; arrows in panel A). PTCA was performed using a standard technique. We used a hydrophilic coated extra-support guidewire (Choice-PT extra-support; Boston Scientific,

Miami, FL, USA) and a 2 × 20 monorail balloon catheter (Worldpass; Cordis Europa NV, Roden, The Netherlands) to cross and dilate the coronary lesion (maximum balloon pressure, 3 bar). During balloon dilatation, the patient developed transient chest pain, and the angiogram recorded immediately after angioplasty showed a long, parallel, double-lumen dissection with distal thrombolysis in myocardial infarction (TIMI) grade 3 flow (Figure 1, arrow in panel B). The hemodynamic status of the patient was stable without chest pain, and he had electrocardiographic evidence of ischemia for several minutes during the following observation period. As sub-intimal wire penetration was suspected, the patient was treated medically without placement of a stent. Cardiac enzyme levels were not elevated after the procedure, and the patient was discharged uneventfully. He remained asymptomatic, and 1 year later, a follow-up angiogram revealed a double-barrel dissection without compromise of the distal blood flow (Figure 1, arrows in panels C and D).

Discussion

Coronary artery dissection is a common occurrence after PTCA. Non-flow-limiting dissections should not necessarily be considered as a complication since the

*Correspondence to: Dr. Wan-Leong Chan, Division of Cardiology, Department of Medicine, Taipei Veterans General Hospital, 201, Section 2, Shih-Pai Road, Taipei 112, Taiwan, R.O.C.

E-mail: wlichen@vghtpe.gov.tw • Received: May 27, 2004 • Accepted: February 3, 2005

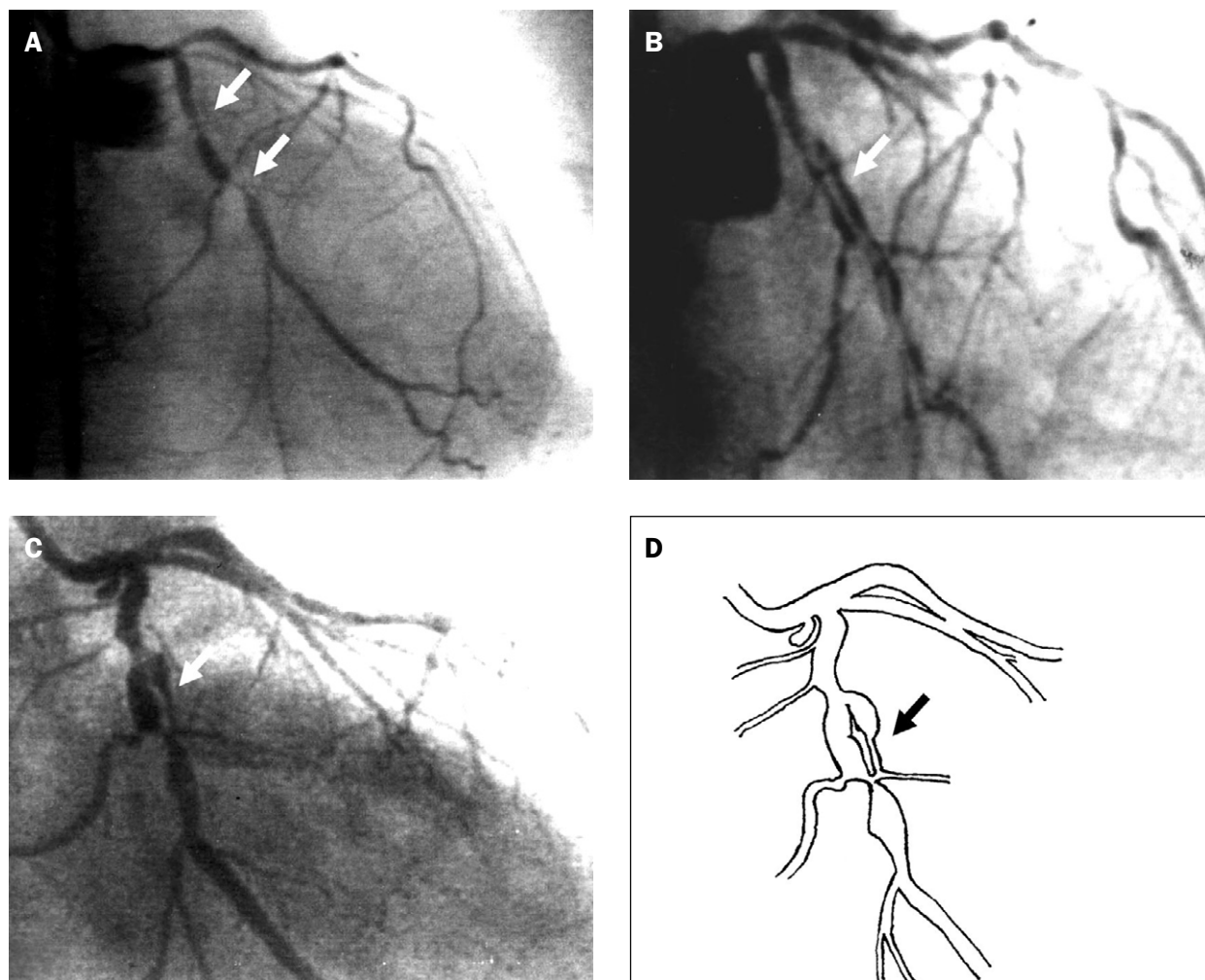


Figure 1. Coronary angiograms showing: (A) 2 stenotic lesions in the left circumflex artery (arrows); and (B) a long, parallel, double-lumen dissection with distal thrombolysis in myocardial infarction (TIMI) grade 3 flow (arrow). Follow-up angiograms revealed: (C, D) a double-barrel dissection without compromise of the distal blood flow (arrows).

mechanism of lumen enlargement for PTCA involves stretching of the vessel and cracking of plaque, which manifests as dissections.² Although most balloon-induced dissections heal spontaneously,³ complex and severe coronary artery dissections may result in acute closure of a coronary artery and may increase the risks of ischemic complications;⁴ the latter can be prevented effectively by coronary stenting. In this case, a long and complex dissection after balloon dilatation carried a high risk of acute closure and ischemic complications. Fortunately, the dissection healed partially and follow-up angiography showed the rare picture of “double-barrel” coronary artery. Kimura et al⁵ reported a case of chronic total coronary occlusion treated with PTCA, complicated by subintimal wire penetration and a large dissection flap. A double-barrel lumen configuration was demonstrated by intravascular ultrasound.⁵ In our case, the guidewire may have

dissected the proximal coronary artery lesion through an intimal tear (inlet) and come back to the true lumen through an intimal outlet; thus, after balloon inflation, an extensive double-barrel coronary artery dissection was created. Complicated dissection can be treated by coronary stenting. However, it is essential to ensure that the guidewire is in the true lumen before placing the stent. Despite the high risk of acute closure, complex coronary dissection can be treated medically with close observation if distal coronary flow is not compromised and the clinical condition of the patient is stable.

References

1. Holmes DR Jr, Vlietstra RE, Mock MB, Reeder GS, Smith HC, Bove AA, Bresnahan JF, et al. Angiographic changes produced by percutaneous transluminal coronary angioplasty. *Am J Cardiol* 1983;51:676–83.

2. Sanborn TA, Faxon DP, Haudenschild C, Gottsman SB, Ryan TJ. The mechanisms of transluminal angioplasty: evidence for formation of aneurysms in experimental atherosclerosis. *Circulation* 1983;68:1136–40.
3. Cappelletti A, Margonato A, Rosano G, Mailhac A, Veglia F, Colombo A, Chierchia SL. Short- and long-term evolution of unstented non-occlusive coronary dissection after coronary angioplasty. *J Am Coll Cardiol* 1999;34:1484–8.
4. Bredlan CE, Roubin GS, Leimgruber PP, Douglas JS. In-hospital morbidity and mortality in patients undergoing elective coronary angioplasty. *Circulation* 1985;72:1044–52.
5. Kimura BJ, Tsimikas S, Bhargava V, DeMaria AN, Penny WF. Subintimal wire position during angioplasty of a chronic total coronary occlusion: detection and subsequent procedural guidance by intravascular ultrasound. *Cathet Cardiovasc Diagn* 1995;35:262–5.